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STATE OF DELAWARE
DIVISION OF ENVIRONMENTAL CONTROL
EDWARD TATNALL BUILDING
DOVER, DELAWARE 19901

Februaury 27, 1976

VASUKI
RECTOR

Mr. Charles R. Sherman
E. I. DuPont de Nemours & Company
Engineering Department
Louviers Building
Wilmington, Delaware 19898

ORIGINAL
(Red)

Dear Mr. Sherman:

I am in receipt of your report on ground water conditions at the DuPont Newport landfill site. The report does not discuss the impact of the landfill on water quality in the adjacent and/or underlying surface and ground water. Further, the report contains conclusions which I do not agree with.

You state that there are three "groundwater regimens" on the landfill site:

1. a perched water table in which well SM-1 is screened
2. Pleistocene sediments in which SM-2, DM-1 and ^DSM-2 are supposedly screened, and
3. the upper Potomac aquifer in which the plant wells #11 and #13 are screened.

You state that "there does not appear to be any influence on the water levels in the monitor wells from pumping plant water wells #11 or #13, that "water in the Upper Potomac aquifer does not appear to have been contaminated from the Plant's landfill operations", and that "contaminants in the ground water from the landfill are mostly discharged to the Christina River". Examination of your test boring logs indicates to me that wells SM-1 and SM-2 are both screened in Pleistocene sediments. Furthermore, I see no evidence that indicates the water encountered in SM-1 is perched. In fact, sand was encountered to the base of the boring - which was below sea level. Wells DM-1 and ^DSM-2 appear to be screened in the upper Potomac. If you still have the Shelby tube samples collected during drilling, they will be useful in resolving this matter.

As submitted, your data indicates that water levels in DM-1 and DM-2 are strongly influenced by the plant water supply wells. Water levels rose about 15 feet in both wells after the reported shutdown of plant wells #11 and #13 on January 6, 1976. At the same time, water levels in wells SM-1 and

ARR-00258

Mr. Charles R. Sherman
February 2, 1976
page 2

SM-2 ~~do not~~ appear to have been significantly affected. An aquitard, apparently separating the Pleistocene and Upper Potomac sands at the points measured.

A plot of water level elevations reported for the monitor wells on January 6, 1976 clearly shows that the wells are not screened in the same sand units. However, all the potentiometric maps you submitted with your report (drawn with data reported for January 30, February 2, and February 4, 1976) are drawn with the implicit assumption that the wells screened are in the same sand or that these sands have in direct hydraulic connection.

Your potentiometric maps show that flow in the sands is towards the Christina River from the landfill. In fact, your data do not substantiate this interpretation. You are attempting to define flow directions with only two data points in each of two sand units!

Further, your data indicate that there is a steep vertical hydraulic gradient beneath the landfill. This gradient seems to result from pumpage of plant wells #11 and #13, but may be also, at least partially, result from the pumpage of other wells which tap the Potomac aquifer at some distance from the landfill. The only water level data submitted on your plant wells was a single reading made in July, 1975 prior to construction of the monitor wells. Provision should be made for measuring wells #11 and #13 to determine their relation to the water levels in the monitor wells. In addition, the data collected to assess the influence of pumping the plant wells on the water levels on the monitor wells is inadequate. Water level data should be collected in all wells at a frequency greater than once a week.

The water level data suggest that landfill-generated contaminants may be moving vertically down into the upper Potomac sands. The water quality data shows that chromium (0.36 mg/l) and lead (0.08 mg/l) concentrations in monitor well DM-1 exceed the limits established for potable water (0.05 mg/l for each). Naturally occurring water in the upper Potomac aquifer typically contains no detectable concentrations of either chromium or lead. Sources of both contaminants are known to exist in the landfill in the form of magnetic tape (chromium) and paint pigments (lead). Thus, the data suggest that water quality in the aquifer is being affected by the landfill.

Even more startling is the water quality data submitted for the plant wells. Water from well #11 was reported to have a total chromium concentration of 0.21 mg/l and a lead concentration of 0.73 mg/l. Water from both wells #11 and #13 were reported to have 0.11 mg/l of cyanide. (The drinking water standard for cyanide is 0.01 mg/l). What is this well water used for, and how and where is it discharged?

AR100259

Mr. Charles R. Sherman
February 27, 1976
page 3

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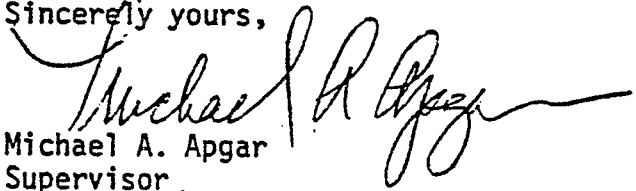
Finally, it is my understanding that a series of shallow monitor wells were installed in the past to monitor chromium concentrations in water in and/or underlying the section of the landfill in which the magnetic tape was buried. I have seen these monitor wells. They are located between the positions of monitor wells SM-2 and DM-2 and are shown on the site location map submitted to me on June 11, 1975 by J. Schwartz, at that time of the plant Environmental Control division.

On the basis of the above comments, a routine monitoring program should be undertaken to assess the impact of the DuPont Newport landfill on adjacent ground and surface water quality. This monitoring program should include a minimum of three wells in each aquifer for the purpose of establishing potentiometric surface data for determining flow direction and vertical hydraulic gradients between the surficial sands in which the landfill is constructed and the underlying Potomac aquifer. I suggest that a monitor well in the Potomac aquifer be constructed on the south side of the Christina River across from the landfill.

The monitor plan should include a method of determining the quality of water leaching from the landfill itself. Of particular interest is the "radio-active wastes". These were identified on the map submitted June 11, 1975 and described as "thoriated nickel (insoluble but radioactive)" in the accompanying letter.

The new monitoring proposal must be submitted to this office by March 15, 1976 for review and approval. Failure to do so will result in referral of this problem to the Attorney General's office. It has taken nine months to develop the existing report. Such delays concerning a potentially serious problem cannot continue. If you have any questions concerning this matter, contact me immediately.

Sincerely yours,


Michael A. Apgar
Supervisor
Water Supply

MAA/ovc

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AR100260